

**CPC****COOPERATIVE PATENT CLASSIFICATION****H03C**

**MODULATION** (measuring, testing G01R; masers, lasers H01S; modulators specially adapted for use in the amplifiers [H03F 3/38](#); modulating pulses [H03K 7/00](#); so-called modulators capable only of a switching between predetermined states of amplitude, frequency or phase [H03K 17/00](#), H04L; coding, decoding or code conversion, in general H03M; synchronous modulators specially adapted for colour television [H04N 9/65](#))

**NOTE**

This subclass covers only modulation, keying, or interruption of sinusoidal oscillations or electromagnetic waves, the modulating signal having any desired waveform.

In this subclass, circuits usable both as modulator and demodulator are classified in the group dealing with the type of modulator involved.

**WARNING**

The following IPC groups are not used in the internal ECLA classification scheme. Subject matter covered by these groups is classified in the following ECLA groups :

[H03C 1/38](#) to [H03C 1/44](#) covered by [H03C 1/36](#)

**H03C 1/00**

**Amplitude modulation** ([H03C 5/00](#), [H03C 7/00](#) take precedence)

## H03C 1/02

. Details

## H03C 1/04

.. Means in or combined with modulating stage for reducing angle modulation

## H03C 1/06

.. Modification of modulator to reduce distortion, e.g. by feedback, and clearly applicable to more than one type of modulator

## H03C 1/08

. by means of variable impedance element ([H03C 1/28](#) to [H03C 1/34](#), [H03C 1/46](#) to [H03C 1/52](#), [H03C 1/62](#) take precedence)

## H03C 1/10

.. the element being a current-dependent inductor

## H03C 1/12

.. the element being a voltage-dependent capacitor

## H03C 1/14

.. the element being a diode

## H03C 1/16

. by means of discharge device having at least three electrodes ([H03C 1/28](#) to [H03C 1/34](#), [H03C 1/50](#), [H03C 1/52](#), [H03C 1/62](#) take precedence)

## H03C 1/18

.. carrier applied to control grid

## H03C 1/20

... modulating signal applied to anode

## H03C 1/22

... modulating signal applied to same grid

## H03C 1/24

... modulating signal applied to different grid

## H03C 1/26

... modulating signal applied to cathode

## H03C 1/28

. by means of transit-time tube

- H03C 1/30 . . . by means of a magnetron
- H03C 1/32 . . . by deflection of electron beam in discharge tube
- H03C 1/34 . . . by means of light-sensitive element
- H03C 1/36 . . . by means of semiconductor device having at least three electrodes ([H03C 1/34](#), [H03C 1/50](#), [H03C 1/52](#), [H03C 1/62](#) take precedence)
- H03C 1/46 . . . Modulators with mechanically or acoustically driven parts
- H03C 1/48 . . . by means of Hall-effect devices
- H03C 1/50 . . . by converting angle modulation to amplitude modulation ([H03C 1/28](#) to [H03C 1/34](#), [H03C 1/46](#), [H03C 1/48](#) take precedence)
- H03C 1/52 . . . Modulators in which carrier or one side-band are wholly or partially suppressed ([H03C 1/28](#) to [H03C 1/34](#), [H03C 1/46](#), [H03C 1/48](#) take precedence)
  - H03C 1/54 . . . . . Balanced modulators, e.g. bridge type, ring type, double balanced type
    - H03C 1/542 . . . . . {comprising semiconductor devices with at least three electrodes}
      - H03C 1/545 . . . . . {using bipolar transistors}
      - H03C 1/547 . . . . . {using field-effect transistors}
    - H03C 1/56 . . . . . comprising variable two-pole elements only
      - H03C 1/58 . . . . . comprising diodes
  - H03C 1/60 . . . . . with one sideband wholly or partially suppressed
- H03C 1/62 . . . Modulators in which amplitude of carrier component in output is dependent upon strength of modulating signal, e.g. no carrier output when no modulating signal is present ([H03C 1/28](#) to [H03C 1/34](#), [H03C 1/46](#), [H03C 1/48](#) take precedence)
  
- H03C 3/00** **Angle modulation** ([H03C 5/00](#), [H03C 7/00](#) take precedence)
  - H03C 3/005 . . . {Circuits for asymmetric modulation}
  - H03C 3/02 . . . Details
    - H03C 3/04 . . . . . Means in or combined with modulating stage for reducing amplitude modulation
    - H03C 3/06 . . . . . Means for changing frequency deviation {for demodulation [H03D 3/003](#), [H03D 3/242](#)}
    - H03C 3/08 . . . . . Modification of modulator to linearise modulation, e.g. by feedback, and clearly applicable to more than one type of modulator
    - H03C 3/09 . . . . . Modifications of modulator for regulating the mean frequency
      - H03C 3/0908 . . . . . { using a phase locked loop}
        - H03C 3/0916 . . . . . { with frequency divider or counter in the loop}
          - H03C 3/0925 . . . . . { applying frequency modulation at the divider in the feedback loop}
          - H03C 3/0933 . . . . . { using fractional frequency division in the feedback loop of the phase locked loop}
        - H03C 3/0941 . . . . . { applying frequency modulation at more than one point in the loop}
        - H03C 3/095 . . . . . { applying frequency modulation to the loop in front of the voltage controlled

- oscillator}
- H03C 3/0958     ....     { applying frequency modulation by varying the characteristics of the voltage controlled oscillator}
- H03C 3/0966     ....     { modulating the reference clock}
- H03C 3/0975     ....     { applying frequency modulation in the phase locked loop at components other than the divider, the voltage controlled oscillator or the reference clock}
- H03C 3/0983     ....     { containing in the loop a mixer other than for phase detection}
- H03C 3/0991     ....     { including calibration means or calibration methods}
- H03C 3/10       .     by means of variable impedance ([H03C 3/30](#) to [H03C 3/38](#) take precedence)
- H03C 3/12       ..    by means of a variable reactive element
- H03C 3/14       ...   simulated by circuit comprising active element with at least three electrodes, e.g. reactance-tube circuit
- H03C 3/145     ....     {by using semiconductor elements}
- H03C 3/16       ....     in which the active element simultaneously serves as the active element of an oscillator
- H03C 3/18       ...    the element being a current-dependent inductor
- H03C 3/20       ...    the element being a voltage-dependent capacitor
- H03C 3/22       ...    the element being a semiconductor diode, e.g. varicap diode
- H03C 3/222     ....     {using bipolar transistors ([H03C 3/227](#) takes precedence)}
- H03C 3/225     ....     {using field effect transistors ([H03C 3/227](#) takes precedence)}
- H03C 3/227     ....     {using a combination of bipolar transistors and field effect transistors}
- H03C 3/24       ..    by means of a variable resistive element, e.g. tube
- H03C 3/245     ...    {by using semiconductor elements}
- H03C 3/26       ...    comprising two elements controlled in push-pull by modulating signal
- H03C 3/28       ..    using variable impedance driven mechanically or acoustically
- H03C 3/30       .     by means of transit-time tube
- H03C 3/32       ..    the tube being a magnetron
- H03C 3/34       .     by deflection of electron beam in discharge tube
- H03C 3/36       .     by means of light-sensitive element
- H03C 3/38       .     by converting amplitude modulation to angle modulation
- H03C 3/40       ..    using two signal paths the outputs of which have a predetermined phase difference and at least one output being amplitude-modulated
- H03C 3/403     ...    {using two quadrature frequency conversion stages in cascade}
- H03C 3/406     ...    {using a feedback loop containing mixers or demodulators}
- H03C 3/42       .     by means of electromechanical devices ([H03C 3/28](#) takes precedence)
- H03C 5/00       Amplitude modulation and angle modulation produced simultaneously or at will by the same modulating signal ([H03C 7/00](#) takes precedence)**
- H03C 5/02       .     by means of transit-time tube

- H03C 5/04 . . the tube being a magnetron
- H03C 5/06 . by deflection of electron beam in discharge tube
- H03C 7/00** **Modulating electromagnetic waves** (modulating light [G02F 1/00](#); for generating oscillations [H03B](#), [H03K](#))
- H03C 7/02 . in transmission line, waveguide, cavity resonator, or radiation field of aerial
- H03C 7/022 . . {using ferromagnetic devices, e.g. ferrites}
- H03C 7/025 . . {using semiconductor devices}
- H03C 7/027 . . . {using diodes}
- H03C 7/04 . . Polarisation of transmitted wave being modulated {[H03C 7/022](#) takes precedence}
- H03C 99/00** **Subject matter not provided for in other groups of this subclass**
- H03C 2200/00** **Indexing scheme relating to details of modulators or modulation methods covered by H03C**
- H03C 2200/0004 . Circuit elements of modulators
- H03C 2200/0008 . . Variable capacitors, e.g. a varicap, a varactor or a variable capacitance of a diode or transistor
- H03C 2200/0012 . . Emitter or source coupled transistor pairs or long tail pairs
- H03C 2200/0016 . . Pre-emphasis or de-emphasis circuits
- H03C 2200/002 . . Filters with particular characteristics
- H03C 2200/0025 . . Gilbert multipliers
- H03C 2200/0029 . . Memory circuits, e.g. ROMs, RAMs, EPROMs, latches, shift registers
- H03C 2200/0033 . . Transmission lines, e.g. striplines, microstrips or coplanar lines
- H03C 2200/0037 . Functional aspects of modulators
- H03C 2200/0041 . . Calibration of modulators
- H03C 2200/0045 . . Pulse width, duty cycle or on/off ratio
- H03C 2200/005 . . Modulation sensitivity
- H03C 2200/0054 . . . Filtering of the input modulating signal for obtaining a constant sensitivity of frequency modulation
- H03C 2200/0058 . . Quadrature arrangements
- H03C 2200/0062 . . Lowering the supply voltage and saving power
- H03C 2200/0066 . . Reduction of carrier leakage or the suppression of the carrier
- H03C 2200/007 . . with one sideband wholly or partially suppressed
- H03C 2200/0075 . . FM modulation down to DC
- H03C 2200/0079 . . Measures to linearise modulation or reduce distortion of modulation characteristics
- H03C 2200/0083 . . . Predistortion of input modulating signal to obtain a linear modulation characteristic
- H03C 2200/0087 . . Measures to address temperature induced variations of modulation

- [H03C 2200/0091](#) . . . by stabilising the temperature
- [H03C 2200/0095](#) . . . by compensating temperature induced variations